PB PARSONS BRINCKERHOFF

BORING LOG
PB-1003R

PACRIM GEOTECHNICAL INC.
GEOTECHNICAL ENGINEERING AND APPLIED EARTH SCIENCES

PROJECT West Side CSO Project
CITY Portland, Oregon
PROJECT NO. 027-003
DATE DRILLED 4/20/01 to 4/24/01

SHEET 2 OF 15
STATION NO. 264+03 (9' L)
SURFACE ELEV. 31.08 ft

INITIAL GWL@ 22.33 ft (4/21/01)
EQUIPMENT Rotosonic Drill
DRILLING METHOD Rotosonic - 8" OD Core Barrel
LOGGED BY KJL

SAMPLE TYPE G Grab Sample No Recovery

ELEVATION (ft)	DEPTH (ft)	SAMPLE TYPE	SAMPLE NO	PID (ppm)	METHANE (ppm)	LAB TESTS	MOISTURE (%)	% FINES	BOX NUMBER	LITHOLOGY	SOIL DESCRIPTION	WELL
											(Qaf Cont'd)	
	25	G	5		>5000	AL	67		5		FAT CLAY WITH ORGANICS (CH); high plasticity, medium toughness, no dilatancy, medium dry strength, gray, strong organic odor with occasional bits of burnt wood and bits of wood/organics, 1/16" in diameter.	
5					1000							
	30	G	6		850				6		POORLY GRADED SAND WITH INTERBEDDED LAYERS OF ORGANIC SILTY CLAY (SP); 100% sand, fine to medium, subangular to subrounded, hard, basalt, quartz, gray, wet; Organic Silty Clay (OL), medium plasticity, medium toughness, slow dilatancy, with occasional organic bits, dark gray, organic odor, wet.	
0					3000							
									7		POORLY GRADED SAND WITH GRAVEL AND COBBLES (SP); 70-75% sand, fine to medium, subangular to rounded, hard, quartz, basalt and others; 25-30% gravel, fine to coarse, cobbles > 6" in diameter, angular, basalt; dark gray, wet.	
		G	7			GSD	22	9			POORLY GRADED GRAVEL WITH COBBLES AND SAND (GP); 65-70% gravel, fine to coarse, cobbles > 6" in diameter, angular, basalt; 30-35% sand, fine to medium, subangular to rounded, basalt, quartz and others; dark gray, wet.	
	35				250						POORLY GRADED GRAVEL WITH COBBLES AND SAND (GP); 65-70% gravel, fine to coarse, cobbles > 6" in diameter, angular, basalt; 30-35% sand, fine to medium, subangular to rounded, basalt, quartz and others; dark gray, wet.	
-5											Boulder or cobbles plugged bit, initially no recovery at 36 to 46 feet, resampled.	
					>5000				8		POORLY GRADED SAND WITH GRAVEL AND COBBLES (SP); 90-95% sand, fine to medium, angular to rounded, hard, basalt, quartz and others; 5-10% gravel, coarse, cobbles > 6", angular, hard, basalt, scattered gravel and cobbles; dark gray to black, wet.	
	40	G	8		1000							
-10											Scattered seam of silty clay generally 1/4" to 1/2" thick.	
		G	9		>5000				9			

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PROJECT West Side CSO Project
CITY Portland, Oregon
PROJECT NO. 027-003
DATE DRILLED 4/20/01 to 4/24/01

SHEET 3 OF 15
STATION NO. 264+03 (9' L)
SURFACE ELEV. 31.08 ft

INITIAL GWL@ 22.33 ft (4/21/01)
EQUIPMENT Rotosonic Drill
DRILLING METHOD Rotosonic - 8" OD Core Barrel
LOGGED BY KJL

SAMPLE TYPE G Grab Sample ▢ No Recovery

ELEVATION (ft)	DEPTH (ft)	SAMPLE TYPE	SAMPLE NO	PID (ppm)	METHANE (ppm)	LAB TESTS	MOISTURE (%)	% FINES	BOX NUMBER	LITHOLOGY	SOIL DESCRIPTION	WELL
											(Qaf Cont'd)	
-15					>5000						ORGANIC SILTY CLAY (OL), medium plasticity, medium to high dry strength, no dilatancy, medium toughness, with scattered bits of organics, strong organic odor, dark gray, moist.	
					>5000				10			
	50	G	10		3000							
-20											Abundant wood fibers from 50-52 ft, strong hydrocarbon and decaying organic odor.	
					>5000						SILTY SAND (SM); 75-80% sand, fine to medium, angular to rounded, hard, basalt, quartz and others; 20-25% silt, non plastic, with scattered organic/wood bits.	
									11		POORLY GRADED SAND (SP), with scattered gravel and occasional seam of organic silty clay; 85-90% sand, fine to medium, angular to rounded, hard, basalt, quartz and others; 10-15% gravel, fine, rounded, basalt and quartzite, dark gray, wet, organic odor.	
	55	G	11		4000	GSD	14	15				
-25					>5000							
									12		POORLY GRADED SAND (SP), with scattered abundant seams of silty sand (SM) and silt (ML); all with bits and pieces of wood; 90-95% sand, fine to medium, angular to rounded, hard, basalt, glass, quartz, scattered pieces of plastic and tin foil.	
	60	G	12		>5000	FC	45	42			SILTY SAND WITH WOOD FIBER (SM); 60-65% sand; 15-20% silt; 15-20% wood fiber and organics.	
											SILTY SAND WITH WOOD FIBER (SM); 60-65% sand; 15-20% silt; 15-20% wood fiber and organics.	
-30					>5000						ORGANIC SILTY CLAY (OL); with sand, wood fiber, pieces of wood and burnt wood chips < 1/4" in size; 20-25% organics bits to 1/4" in diameter by 3-4" long.	
									13			
	65	G	13		>5000	AL	52				Sand/Silt Alluvium (Qal/Qff)	
-35					3600						ORGANIC CLAY with silt (OH); with wood fiber and pieces of wood, high plasticity, no dilatancy, high dry strength, medium toughness, dark gray, organic odor; 5-10% organics bits to 1/4" in diameter by 3-4" long.	

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PROJECT West Side CSO Project
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SHEET 4 OF 15
STATION NO. 264+03 (9' L)
SURFACE ELEV. 31.08 ft

INITIAL GWL@ 22.33 ft (4/21/01)
EQUIPMENT Rotosonic Drill
DRILLING METHOD Rotosonic - 8" OD Core Barrel
LOGGED BY KJL

SAMPLE TYPE G Grab Sample ◯ No Recovery

ELEVATION (ft)	DEPTH (ft)	SAMPLE TYPE	SAMPLE NO	PID (ppm)	METHANE (ppm)	LAB TESTS	MOISTURE (%)	% FINES	BOX NUMBER	LITHOLOGY	SOIL DESCRIPTION	WELL
									14		(Qal/Qff Cont'd) Occasional sand lense.	
		G	14								INTERBEDDED POORLY GRADED SAND WITH GRAVEL (SP) AND ORGANIC CLAY (OH), with pieces of decaying wood 2-3" in length, 1" in diameter; sand, fine to coarse, with scattered fine gravel.	
	70				>5000							
-40					>5000						POORLY GRADED SAND WITH WOOD (SP); 90-95% sand, fine, subangular to rounded, hard, basalt, quartz and others, with bits and pieces of decaying wood and occasional seams to layers of silty sand and sandy silt with wood debris.	
									15			
		G	15								SANDY SILT (ML), with wood and organics; non plastic, rapid dilatancy, wood pieces > 6" in length and 1/4" thick.	
	75				>5000						POORLY GRADED SAND WITH SILT AND WOOD (SP-SM); 85-90% sand, fine; 5-10% silt, non plastic; <5% organics and pieces of wood.	
-45											SANDY SILT WITH PIECES OF WOOD (ML); non plastic, rapid dilatancy, wood to 1/2" in diameter and up to 3-4" in length.	
					1800							
									16		INTERBEDDED SEAMS AND LAYERS OF ORGANIC SILTY CLAY, SILT AND SAND (SP-ML-OH): Silt (ML), low plasticity, rapid dilatancy, with wood, dark gray, strong organic odor, wet; Sand (SP), fine to medium, angular to rounded, variety of types, dark gray, wet, with pieces and bits of wood; and Silty Clay (CL), medium plasticity, no dilatancy.	
		G	16									
	80				>5000							
-50					>5000						SILT (ML), with wood; low plasticity, rapid dilatancy, low toughness, medium to high dry strength, dark gray; interbedded with seams or layers of Sand (SP), fine to medium, angular to rounded, with wood; dark gray, wet.	
									17			
		G	17								Seam of fine to medium sand with rounded pebbles of pumice at 84 ft.	
	85				>5000							
-55					1600							
									18		1-2" thick layer of volcanic ash at 89 ft.	
		G	18								POORLY GRADED SAND WITH WOOD (SP); grades from fine at 89 ft to fine to coarse at 91 ft; 95-100% sand, fine to medium, angular to rounded, hard, basalt, quartz, glass.	

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SHEET 5 OF 15
STATION NO. 264+03 (9' L)
SURFACE ELEV. 31.08 ft

INITIAL GWL@ 22.33 ft (4/21/01)
EQUIPMENT Rotosonic Drill
DRILLING METHOD Rotosonic - 8" OD Core Barrel
LOGGED BY KJL

SAMPLE TYPE G Grab Sample No Recovery

ELEVATION (ft)	DEPTH (ft)	SAMPLE TYPE	SAMPLE NO	PID (ppm)	METHANE (ppm)	LAB TESTS	MOISTURE (%)	% FINES	BOX NUMBER	LITHOLOGY	SOIL DESCRIPTION	WELL
					>5000						quartzite and soft pumice; <2% wood bits.	
											(Qal/Qff Cont'd)	
-60											Layer of medium to coarse sand with gravel, composed predominantly of white pumice at 91 ft.	
											Note: No Recovery from 91 to 96 ft -- sample washed out of core barrel while being extracted from hole.	
											POORLY GRADED SAND (SP); 100% sand, fine to medium, angular to rounded, dark gray to black, wet.	
									19			
	95											
-65												
									20			
		G	19									
	100											
-70												
											Note: No Recovery from 102 to 106 ft -- Sample washed out of core barrel and through catcher while being extracted out of hole. Recovered at top of next core run.	
									21			
		G	20									
	105											
-75											POORLY GRADED SAND (SP); 95-100% sand, fine to medium, angular to rounded, basalt, quartz, glass and others; <2% gravel, fine, rounded, scattered, basalt, weathered granite, black, wet.	
					2700				22			
		G	21									
	110				2800							
-80					>5000							

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SHEET 6 OF 15
STATION NO. 264+03 (9' L)
SURFACE ELEV. 31.08 ft

INITIAL GWL@ 22.33 ft (4/21/01)
EQUIPMENT Rotosonic Drill
DRILLING METHOD Rotosonic - 8" OD Core Barrel
LOGGED BY KJL

SAMPLE TYPE G Grab Sample C No Recovery

ELEVATION (ft)	DEPTH (ft)	SAMPLE TYPE	SAMPLE NO	PID (ppm)	METHANE (ppm)	LAB TESTS	MOISTURE (%)	% FINES	BOX NUMBER	LITHOLOGY	SOIL DESCRIPTION	WELL
											(Qal/Qff Cont'd)	
									23			
		G	22		>5000							
	115											
-85					650						Note: 20 ft of heave after pulling core barrel with sample from 106-116 ft. Grades; 90-95% sand; 5-10% gravel, fine to coarse, subrounded to rounded, hard, basalt, and others.	
			TUNNEL CROWN									
									24			
		G	23								POORLY GRADED SAND (SP); 100% sand, fine, angular to rounded, basalt, quartz, glass and others; <2% gravel, fine, rounded, basalt and weathered granite, black, wet.	
	120				4250							
-90											POORLY GRADED SAND (SP) WITH SILT SEAMS (ML): 100% sand, fine, dark gray; interbedded with Organic Silty Clay and Sandy Silt seams/layers from 1/2" to 2" thick: Organic Silty Clay (OL), medium plasticity, no dilatancy, medium toughness, high dry strength, with bits and small pieces of wood and organics, dark gray, organic odor; and Sandy Silty (ML), non plastic, rapid dilatancy, dark gray, organic odor with bits of wood/organics.	
					1200				25			
		G	24									
	125				>5000							
-95											POORLY GRADED SAND WITH SILT (SP-SM); 80-85% fine sand with silt; 15-20% silt seams, non plastic, rapid dilatancy, dark gray, organic odor; scattered seams of silt, non plastic; dark gray, wet.	
					4600							
									26			
		G	25		2500							
	130										INTERBEDDED POORLY GRADED SAND AND SILTY SAND (SP-SM): Sand, fine to medium, dark gray, wet; Silty Sand, 75-80% fine sand and 20-25% silt, non plastic, rapid dilatancy; with scattered seams of silt, low plasticity, slow dilatancy, dark gray, wet, organic odor.	
-100					1000							
			TUNNEL INVERT									
									27		POORLY GRADED SAND (SP); 100% sand, fine to medium, subangular to rounded, basalt, quartz, glass and others, dark gray, wet; occasional seam of sandy silt.	
		G	26					57			POORLY GRADED SAND (SP); 100% sand, fine to medium, subangular to rounded,	

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PROJECT: West Side CSO Project
CITY: Portland, Oregon
PROJECT NO.: 027-003
DATE DRILLED: 4/20/01 to 4/24/01

SHEET 7 OF 15
STATION NO.: 264+03 (9' L)
SURFACE ELEV.: 31.08 ft

INITIAL GWL@: 22.33 ft (4/21/01)
EQUIPMENT: Rotosonic Drill
DRILLING METHOD: Rotosonic - 8" OD Core Barrel
LOGGED BY: KJL

SAMPLE TYPE: G Grab Sample; No Recovery

ELEVATION (ft)	DEPTH (ft)	SAMPLE TYPE	SAMPLE NO	PID (ppm)	METHANE (ppm)	LAB TESTS	MOISTURE (%)	% FINES	BOX NUMBER	LITHOLOGY	SOIL DESCRIPTION	WELL
105					900						basalt, quartz, glass and others, dark gray, wet; occasional seam of sandy silt.	
											(Qal/Qff Cont'd)	
					600						POORLY GRADED SAND (SP); 100% sand, fine to medium, subangular to rounded, basalt, quartz, glass and others, dark gray, wet; occasional seam of sandy silt.	
									28			
	140	G	27		500							
110											**Gravel Alluvium (Qfc)**	
					1500						POORLY GRADED GRAVEL WITH SAND (GP); 75-80% gravel, fine to coarse, subrounded to rounded, predominantly basalt and other volcanics, some quartzite; 20-25% sand, fine to medium, trace coarse, angular to rounded, basalt and quartz.	
									29			
	145	G	28		1700	GSD	39					
115					2600							
									30		POORLY GRADED SAND WITH GRAVEL; 90-95% sand, fine to medium, angular to rounded, basalt, quartz, glass and others; 5-10% gravel.	
	150	G	29		3500	GSD	6	5			POORLY GRADED GRAVEL WITH SAND AND COBBLES (GP); 65-70% gravel, fine to coarse, cobbles to 5", subrounded to rounded, predominantly basalt, some quartzite and others; 30-35% sand, fine to medium, angular to rounded, basalt, quartz and others; <2% silt; gray, wet.	
120					4500						POORLY GRADED GRAVEL WITH SAND (GP); 70-75% gravel, fine to coarse, subrounded to rounded, basalt, other volcanics and some quartzite; 25-30% sand, fine to coarse, subangular to rounded, basalt, quartz, glass, others, gray, wet.	
									31			
	155	G	30		3100	GSD	5	3			Falling head test 155 to 156 feet.	
125											Disturbed sample- washed during drilling.	
					0							

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SHEET 8 OF 15
STATION NO. 264+03 (9' L)
SURFACE ELEV. 31.08 ft

INITIAL GWL@ 22.33 ft (4/21/01)
EQUIPMENT Rotosonic Drill
DRILLING METHOD Rotosonic - 8" OD Core Barrel
LOGGED BY KJL

SAMPLE TYPE G Grab Sample ◯ No Recovery

ELEVATION (ft)	DEPTH (ft)	SAMPLE TYPE	SAMPLE NO	PID (ppm)	METHANE (ppm)	LAB TESTS	MOISTURE (%)	% FINES	BOX NUMBER	LITHOLOGY	SOIL DESCRIPTION	WELL
											(Qfc Cont'd)	
									32		POORLY GRADED GRAVEL WITH SAND (GP); 55-60% gravel, fine to coarse, subangular to rounded, basalt, andesite, quartzite and others; 40-45% sand, fine to medium, subangular to rounded, basalt, glass and others, black, wet. Easy drilling.	
	160	G	31		1450							
130					900						POORLY GRADED GRAVEL WITH SAND (GP); 80-85% gravel, fine to coarse, subrounded to rounded, predominantly basalt, andesite and other volcanics, some quartzite; 15-20% sand, fine to coarse, subangular to rounded, basalt, quartz, glass and others; brown, wet.	
									33		POORLY GRADED GRAVEL WITH SAND (GP); 55-60% gravel, fine to coarse, subrounded to rounded, hard, predominantly basalt and andesite, some quartzite and others; 40-45% sand, fine to medium, subangular to angular, basalt, quartz, glass and others; black, wet. Coarse gravel and cobble at 166 ft. Note: No Recovery, 166 to 171 feet. Note: After completing falling head test at 155-156 ft, material that had sloughed into the hole between 156-166 was washed out as the 8-inch casing was driven to 166 ft. Sand and gravel below 166 to 170 ft may have been washed out into the formation leaving gravel behind.	
	165	G	32		3200	GSD	10	2				
135												
									34			
	170	G	33									
140					1500						POORLY GRADED GRAVEL WITH SAND (GP); 75-80% gravel, fine to coarse, subrounded to rounded, hard, vesicular basalt, andesite, some quartzite and others; 20-25% sand, fine to coarse, subangular to rounded, hard, basalt, quartz, glass and others, gravel to 3" in diameter and up to 4" in length.	
									35			
	175	G	34		1650	GSD	5	1				
145					2000						POORLY GRADED GRAVEL WITH SAND (GP); 70-75% gravel, fine to coarse, cobbles to 5 inch; subrounded to rounded, hard, basalt, andesite, some quartzite and others; 25-30% sand, fine to medium, subangular to rounded, hard, basalt, quartz and others.	
									36		WELL GRADED GRAVEL WITH SAND (GW); 85-90% gravel, fine to coarse; 10-15% sand, fine to coarse, subangular to rounded, hard, basalt, quartz and others. Harder drilling at 180 ft. (Troutdale)	
		G	35									

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DATE DRILLED 4/20/01 to 4/24/01

SHEET 9 OF 15
STATION NO. 264+03 (9' L)
SURFACE ELEV. 31.08 ft

INITIAL GWL@ 22.33 ft (4/21/01)
EQUIPMENT Rotosonic Drill
DRILLING METHOD Rotosonic - 8" OD Core Barrel
LOGGED BY KJL

SAMPLE TYPE G Grab Sample ▢ No Recovery

ELEVATION (ft)	DEPTH (ft)	SAMPLE TYPE	SAMPLE NO	PID (ppm)	METHANE (ppm)	LAB TESTS	MOISTURE (%)	% FINES	BOX NUMBER	LITHOLOGY	SOIL DESCRIPTION	WELL
					1050						**Troutdale (Tt)**	
150					1600				37		POORLY GRADED GRAVEL WITH COBBLES AND SAND (GP); 75-80% gravel, fine to coarse, abundant cobbles > 7" in length and 4" in diameter, subrounded to rounded, hard, predominantly basalt, andesite, some quartzite; 20-25% sand, fine to medium, subangular to rounded, hard, basalt, quartz and others; <5% silt.	
	185	G	36		1450						WELL GRADED GRAVEL WITH COBBLES AND SAND (GW); 70-75% gravel, fine to coarse, cobbles > 6", subrounded to rounded, hard, basalt, andesite, some quartzite; 25-30% sand, fine to coarse, subangular to rounded; gray, wet.	
155					1850						POORLY GRADED GRAVEL WITH COBBLES AND SAND (GP); 65-70% gravel, fine to coarse, cobbles >6" in diameter, subrounded to rounded; 30-35% sand, fine to medium, subangular to subrounded, hard, basalt, quartz, glass; gray, wet.	
									38		POORLY GRADED GRAVEL WITH COBBLES (GP); 85-90% gravel, fine to coarse, cobbles to 4" in diameter, subrounded to rounded, hard, predominantly basalt; 5-10% sand, fine, predominantly quartz, glass; <5% silt; greenish gray.	
	190	G	37		250	GSD	5	4				
160					1450						POORLY GRADED GRAVEL WITH SAND (GP); 65-70% gravel, fine to coarse, subrounded to rounded, predominantly basalt, andesite and some quartzite, gravel has occasional spotty coating of fine to medium sand cemented to surface, some basalt has pyrite on surface; 30-35% sand, fine to medium, angular to subrounded, predominantly quartz, glass and very little mica; greenish gray, wet.	
									39			
	195	G	38		2100							
165		G	38A			GSD	7	3			Note: 10 ft of heave after pulling sample from 186 to 196 ft with 8" casing.	
											Falling head test at 196 to 198 feet.	
									40		POORLY GRADED GRAVEL WITH COBBLES, SAND, AND SILT (GP-GM); 75-80% gravel, fine to coarse, cobbles >6" in length, subangular to rounded, hard, predominantly basalt, andesite, some quartzite; 15-20% sand, fine to medium; 5-8 % silt, non plastic, gray, wet.	
	200	G	39									
170					600							

WSCSO PH-B C & D WSCSO-C GPJ WEST_CSO GDT 9/4/01

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DATE DRILLED 4/20/01 to 4/24/01

SHEET 10 OF 15
STATION NO. 264+03 (9' L)
SURFACE ELEV. 31.08 ft

INITIAL GWL@ 22.33 ft (4/21/01)
EQUIPMENT Rotosonic Drill
DRILLING METHOD Rotosonic - 8" OD Core Barrel
LOGGED BY KJL

SAMPLE TYPE G Grab Sample ○ No Recovery

ELEVATION (ft)	DEPTH (ft)	SAMPLE TYPE	SAMPLE NO	PID (ppm)	METHANE (ppm)	LAB TESTS	MOISTURE (%)	% FINES	BOX NUMBER	LITHOLOGY	SOIL DESCRIPTION	WELL
											(Tt Cont'd)	
									41		POORLY GRADED GRAVEL WITH COBBLES AND SAND (GP); 75-80% gravel, fine to coarse, cobbles to 4", subangular to rounded, hard, predominantly basalt, andesite, some quartzite, some gravel has spotty coating of fine to medium sand cemented to surface; 20-25% sand, fine to medium, subangular to subrounded, quartz, glass, basalt; dark gray, wet.	
	205	G	40		600							
175					500				42		Grades: 65-70% gravel, 30-35% sand.	
		G	41			GSD	6	3				
	210				550							
180					1100				43			
		G	42									
	215				850							
185					0				44		Note: Switched to 3.5-inch I.D. core barrel.	
		G	43									
	220				0							
190					0				45			
		G	44			GSD	7	6				

WSCSO P1-B C & D WSCSO-C.GPJ WEST_CSO.GDT 9/4/01

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CITY Portland, Oregon
PROJECT NO. 027-003
DATE DRILLED 4/20/01 to 4/24/01

SHEET 11 OF 15
STATION NO. 264+03 (9' L)
SURFACE ELEV. 31.08 ft

INITIAL GWL@ 22.33 ft (4/21/01)
EQUIPMENT Rotosonic Drill
DRILLING METHOD Rotosonic - 8" OD Core Barrel
LOGGED BY KJL

SAMPLE TYPE G Grab Sample ◯ No Recovery

ELEVATION (ft)	DEPTH (ft)	SAMPLE TYPE	SAMPLE NO	PID (ppm)	METHANE (ppm)	LAB TESTS	MOISTURE (%)	% FINES	BOX NUMBER	LITHOLOGY	SOIL DESCRIPTION	WELL
											(Tt Cont'd)	
-195					700						Note: 10 ft of heave in 5" casing after extracting core barrel with sample from 216 to 226 ft.	
					350				46			
	230	G	45		0							
-200					500						Becomes 60-65% gravel, 30-35% sand and 5% silt.	
									47			
		G	46								POORLY GRADED GRAVEL WITH SAND AND SILT/ SILTY CLAY (GP-GM); 60-65% gravel, fine to coarse, subrounded to rounded, hard, predominantly basalt and andesite; 30-35% sand, fine to medium, subangular to subrounded, hard, quartz, glass and others; 5-15% silt to silty clay; dark gray, wet.	
	235				350							
-205					0							
									48			
		G	47			GSD	6	8				
	240				200							
-210					0							
									49			
		G	48								SANDY SILT (ML), with partings of decomposed organics, low to medium plasticity, slow dilatancy when wetted, no toughness, medium dry strength, gray brown to brown, moist to wet, very hard.	
	245				250						POORLY GRADED SAND (SP); 95% sand, fine to medium, subangular to subrounded, predominantly quartz, glass, basalt and mica; <5% silt; light gray to greenish gray, wet.	
-215											SANDY SILT (ML); low plasticity, rapid dilatancy on wetted sample; sand, fine, some mica; brown, moist, with bits of organics.	
					->5000							

WSCSO PH-B C & D WSCSO-C.GPJ WEST_CSO.GDT 9/4/01

PB PARSONS BRINCKERHOFF

BORING LOG
PB-1003R

PACRIM GEOTECHNICAL INC.
GEOTECHNICAL ENGINEERING AND APPLIED EARTH SCIENCES

PROJECT West Side CSO Project
CITY Portland, Oregon
PROJECT NO. 027-003
DATE DRILLED 4/20/01 to 4/24/01

SHEET 12 OF 15
STATION NO. 264+03 (9' L)
SURFACE ELEV. 31.08 ft

INITIAL GWL@ 22.33 ft (4/21/01)
EQUIPMENT Rotosonic Drill
DRILLING METHOD Rotosonic - 8" OD Core Barrel
LOGGED BY KJL

SAMPLE TYPE G Grab Sample No Recovery

ELEVATION (ft)	DEPTH (ft)	SAMPLE TYPE	SAMPLE NO	PID (ppm)	METHANE (ppm)	LAB TESTS	MOISTURE (%)	% FINES	BOX NUMBER	LITHOLOGY	SOIL DESCRIPTION	WELL
											(Tt Cont'd)	
									50		POORLY GRADED SAND (SP); 95-100% sand, fine to medium, subangular to subrounded, hard, predominantly quartz, glass and basalt, occasional seam of silty sand; light gray, wet.	
		G	49									
	250				>5000							
-220											Pieces of wood in sand from 250.5 ft to 251 ft.	
					1000							
									51			
		G	50			GSD	21	8				
	255				1600						POORLY GRADED SAND WITH GRAVEL (SP); 85-90% sand, fine to medium; 10-15% gravel, fine to coarse, rounded.	
											POORLY GRADED SAND (SP); 95-100% sand, fine to medium, subangular to rounded, quartz, glass and basalt; occasional scattered gravel, fine, rounded, light gray, wet.	
-225					1000						Note: 30 feet of heave after extracting sample from 246 to 256 feet.	
									52			
		G	51									
	260				1600						Grades with gravel.	
-230												
					4500						POORLY GRADED GRAVEL WITH SAND (GP); 60-65% gravel, fine to coarse, subrounded to rounded, hard, predominantly basalt and andesite; 35-40% sand, fine to medium, subangular to subrounded, hard, quartz, glass, basalt and some mica; light gray to greenish gray, wet.	
									53			
		G	52									
	265				>5000							
-235											POORLY GRADED GRAVEL WITH SAND AND SILT (GP-GM); 65-70% gravel, fine to coarse, subrounded to rounded, hard, predominantly basalt and andesite; 25-30% sand, fine to medium, subangular to subrounded, hard, quartz, glass, basalt, some mica; 5-10% silt; dark gray, wet.	
					900							
									54			
		G	53			FC	5	13				

WSCSO PH B C & D WSCSO-C.GPJ WEST_CSO.GDT 9/4/01

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GEOTECHNICAL ENGINEERING AND APPLIED EARTH SCIENCES

PROJECT West Side CSO Project
CITY Portland, Oregon
PROJECT NO. 027-003
DATE DRILLED 4/20/01 to 4/24/01

SHEET 13 OF 15
STATION NO. 264+03 (9' L)
SURFACE ELEV. 31.08 ft

INITIAL GWL@ 22.33 ft (4/21/01)
EQUIPMENT Rotosonic Drill
DRILLING METHOD Rotosonic - 8" OD Core Barrel
LOGGED BY KJL

SAMPLE TYPE G Grab Sample ◯ No Recovery

ELEVATION (ft)	DEPTH (ft)	SAMPLE TYPE	SAMPLE NO	PID (ppm)	METHANE (ppm)	LAB TESTS	MOISTURE (%)	% FINES	BOX NUMBER	LITHOLOGY	SOIL DESCRIPTION
					>5000						**(Tt Cont'd)**
240					>5000				55		CLAYEY GRAVEL WITH SAND (GC); 70-75% gravel, fine to coarse, subrounded to rounded, hard, predominantly basalt, andesite and some quartzite; 15-20% sand, fine to medium, subangular to subrounded, hard, quartz, glass, basalt and some mica; 10-15% silty clay; dark gray, wet; very dense. Very hard drilling at 270 feet.
		G	54			GSD	7	21			
	275	G	55		>5000						CLAYEY GRAVEL / WEAKLY CEMENTED CONGLOMERATE (GC); 70-75% gravel, fine to coarse, subrounded to rounded, hard, basalt and andesite; 10-15% sand, fine to medium; 15-20% silty clay, dark gray, moist, weakly cemented, poorly indurated.
245											POORLY GRADED GRAVEL WITH SAND (GP); 65-70% gravel, fine to coarse, subrounded to rounded, predominantly basalt, andesite and some quartzite; 30-35% sand, fine to medium, subangular to rounded, quartz, glass and basalt; gray, wet.
					3850				56		
		G	56			GSD	5	4			
	280				>5000						Grades to 50-55% gravel and 45-50% sand.
250											
					1250						Harder Drilling.
									57		SILTY GRAVEL WITH SAND (GM); 65-70% gravel, fine to coarse, subrounded to rounded, predominantly basalt, andesite and some quartzite; 15-20% sand, fine to medium, subangular to rounded, predominantly basalt, andesite and some quartzite; 15-20% silt to silty clay; dark gray, wet.
		G	57								
	285				>5000						Very hard drilling at 285 feet- cored cobble. POORLY GRADED GRAVEL WITH SAND AND COBBLES (GP); 75-80% gravel, fine to coarse, cobbles > 4", subrounded to rounded, predominantly basalt and andesite; 15-20% sand, fine to medium, quartz, glass, basalt and others; <5% silt.
255											
					250						**Sandy River Mudstone (Tsr)**
									58		SILTY CLAY / MUDSTONE (CL), low to medium plasticity, slow dilatancy when remolded and wetted, high dry strength, low toughness, mottled light gray/pale green to dark green; moist,very hard, overconsolidated.
		G	58								
	290				650						
260											FAT CLAY / CLAYSTONE (CH), medium plasticity, high dry strength, no dilatancy, low to medium toughness, hard, some varve like features, distorted; mottled pale green, light gray
					0						

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PACRIM GEOTECHNICAL INC.
GEOTECHNICAL ENGINEERING AND APPLIED EARTH SCIENCES

PROJECT West Side CSO Project
CITY Portland, Oregon
PROJECT NO. 027-003
DATE DRILLED 4/20/01 to 4/24/01

SHEET 14 OF 15
STATION NO. 264+03 (9' L)
SURFACE ELEV. 31.08 ft

INITIAL GWL@ 22.33 ft (4/21/01)
EQUIPMENT Rotosonic Drill
DRILLING METHOD Rotosonic - 8" OD Core Barrel
LOGGED BY KJL

SAMPLE TYPE G Grab Sample ▨ No Recovery

ELEVATION (ft)	DEPTH (ft)	SAMPLE TYPE	SAMPLE NO	PID (ppm)	METHANE (ppm)	LAB TESTS	MOISTURE (%)	% FINES	BOX NUMBER	LITHOLOGY	SOIL DESCRIPTION	WELL
									59		to dark green, moist, very hard, overconsolidated. (Tsr Cont'd)	
	295	G	59		250	AL. HYD	35	100				
-265					250						Drove outer casing to 296 ft using water. After unscrewing the drill head from the casing, there was a slight water flow coming from the casing for a short period. The formation would not take water.	
									60		SILTY CLAY / MUDSTONE (CL), low to medium plasticity, slow dilatancy when molded and wetted, high dry strength, low toughness, mottled light gray/pale green to dark green; moist.	
	300	G	60		250						SILT (ML), non plastic, medium dry strength, rapid dilatancy when wetted and molded, no toughness; dark greenish gray with mottled zones of dark brown, moist to wet, very hard, overconsolidated.	
-270					300							
									61		SILTY CLAY / CLAYSTONE (CL); medium plasticity, high dry strength, no dilatancy on either undisturbed or remolded and wetted sample, medium toughness, distorted varve-like features; greenish gray, moist, very hard, overconsolidated.	
	305	G	61		350	AL. HYD	30	94				
-275					0							
									62			
	310	G	62		450							
-280					350							
									63			
		G	63				29					

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PACRIM GEOTECHNICAL INC.
GEOTECHNICAL ENGINEERING AND APPLIED EARTH SCIENCES

PROJECT West Side CSO Project
CITY Portland, Oregon
PROJECT NO. 027-003
DATE DRILLED 4/20/01 to 4/24/01

SHEET 15 OF 15
STATION NO. 264+03 (9' L)
SURFACE ELEV. 31.08 ft

INITIAL GWL@ 22.33 ft (4/21/01)
EQUIPMENT Rotosonic Drill
DRILLING METHOD Rotosonic - 8" OD Core Barrel
LOGGED BY KJL

SAMPLE TYPE G Grab Sample No Recovery

ELEVATION (ft)	DEPTH (ft)	SAMPLE TYPE	SAMPLE NO	PID (ppm)	METHANE (ppm)	LAB TESTS	MOISTURE (%)	% FINES	BOX NUMBER	LITHOLOGY	SOIL DESCRIPTION
-285	320				550						(Tsr Cont'd) SILTY CLAY / CLAYSTONE (CL); medium plasticity, high dry strength, no dilatancy on either undisturbed or remolded and wetted sample, medium toughness, distorted varve-like features; greenish gray, moist. Boring completed to a depth of 316 on 4/24/01.
-290											
	325										
-295											
	330										
-300											
	335										
-305											

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BORING LOG
PB-1004R

Foundation Engineering, Inc.

PROJECT West Side CSO Project
CITY Portland, Oregon
PROJECT NO. 2002013
DATE DRILLED 5/22/01 to 5/23/01

SHEET 1 OF 5
STATION NO. 244+41 28R
SURFACE ELEV. 32.68 ft
CORE BARREL SIZE 6 in.

INITIAL GWL@ 21 ft (5/22/01)
EQUIPMENT Boart Longyear Rotosonic Drill
DRILLING METHOD Rotosonic
LOGGED BY BF

SAMPLE TYPE Grab Sample No Recovery

ELEVATION (ft)	DEPTH (ft)	SAMPLE TYPE	SAMPLE NO	PID (ppm)	METHANE (ppm)	LAB TESTS	MOISTURE CONT.	% FINES	BOX NUMBER	LITHOLOGY	SOIL DESCRIPTION	WELL
											ASPHALTIC CONCRETE.	
					0						BASEROCK (GW); 1-inch minus crushed rock, (Fill).	
30					0				1		POORLY GRADED GRAVEL (GP); coarse rounded gravel, brown grey, moist, (Fill).	
	5				0						POORLY GRADED SAND (SP); trace fine gravel, medium sand, brown, moist, (Fill).	
25					0				2		POORLY GRADED SAND (SP); fine to medium sand, brown, moist, (Fill).	
	10						4	2.1				
					850				3		POORLY GRADED GRAVEL WITH SAND (GP); rounded, fine to coarse gravel, some fine to coarse sand, trace silt, brown, moist, (Fill).	
20		G	1								POORLY GRADED SAND (SP); trace gravel, trace silt, (Fill).	
	15				0							
									4		POORLY GRADED SAND WITH GRAVEL (SP); brown, moist, (Fill).	
15					2700						POORLY GRADED SAND (SP); medium sand, brown, moist, (Fill).	
	20				1200							
▼							38	43				
10		G	2		1400				5		SILTY SAND (SM); medium sand, some silt, trace organics, grey, moist to wet, (Sand/Silt Alluvium).	
						LL=47 PL=32	46					
	25	G	3		300						SILT (ML); low to medium plasticity, brown, iron-stained, moist to wet, (Sand/Silt Alluvium).	
5		G	4		200				6			
	30	G	5									
						LL=52 PL=32	50					
0		G	6		0				7		ELASTIC SILT (MH); some to trace clay, medium to high plasticity, grey, moist, (Sand/Silt Alluvium).	
											Becomes with few sand.	
	35	G	7		0							
						LL=50 PL=32	47					

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BORING LOG
PB-1004R

Foundation Engineering, Inc

PROJECT West Side CSO Project
CITY Portland, Oregon
PROJECT NO. 2002013
DATE DRILLED 5/22/01 to 5/23/01

SHEET 2 OF 5
STATION NO. 244+41 28R
SURFACE ELEV. 32.68 ft
CORE BARREL SIZE 6 in.

INITIAL GWL@ 21 ft (5/22/01)
EQUIPMENT Boart Longyear Rotosonic Drill
DRILLING METHOD Rotosonic
LOGGED BY BF

SAMPLE TYPE G Grab Sample ◯ No Recovery

ELEVATION (ft)	DEPTH (ft)	SAMPLE TYPE	SAMPLE NO	PID (ppm)	METHANE (ppm)	LAB TESTS	MOISTURE CONT.	% FINES	BOX NUMBER	LITHOLOGY	SOIL DESCRIPTION	WELL
	40	G	8		200 400	LL=72 PL=42	75		8		ELASTIC SILT (MH); some to trace clay, medium to high plasticity, grey, moist, (Sand/Silt Alluvium).	
-10		G	9		2100 0				9		Becomes wet.	
	45											
-15		G	10		0 0				10			
	50											
-20		G	11		0				11			
	55				0						SILT (ML); low plasticity, grey, wet, micaceous, (Sand/Silt Alluvium).	
-25					0				12			
	60				600	LL=40 PL=32	38					
-30		G	12		250 2850				13		Becomes with trace fine sand.	
	65											
-35		G	13		2850				14			
	70				200							
-40		G	14		500				15		SILT WITH SAND (ML); little fine sand, grey, wet, (Sand/Silt Alluvium).	

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Foundation Engineering, Inc.

PROJECT West Side CSO Project
CITY Portland, Oregon
PROJECT NO. 2002013
DATE DRILLED 5/22/01 to 5/23/01

SHEET 3 OF 5
STATION NO. 244+41 28R
SURFACE ELEV. 32.68 ft
CORE BARREL SIZE 6 in.

INITIAL GWL@ 21 ft (5/22/01)
EQUIPMENT Boart Longyear Rotosonic Drill
DRILLING METHOD Rotosonic
LOGGED BY BF

SAMPLE TYPE [G] Grab Sample [O] No Recovery

ELEVATION (ft)	DEPTH (ft)	SAMPLE TYPE	SAMPLE NO	PID (ppm)	METHANE (ppm)	LAB TESTS	MOISTURE CONT.	% FINES	BOX NUMBER	LITHOLOGY	SOIL DESCRIPTION	WELL
		G			1200						SILT WITH SAND (ML); little fine sand, grey, wet, (Sand/Silt Alluvium).	
					8000	LL=36 PL=32	38	66			SANDY SILT (ML); some fine sand, low plasticity, grey, moist to wet, (Sand/Silt Alluvium).	
-45		G	15						16			
	80				3000		39					
-50		G	16		2250				17			
	85				850							
-55					600				18			
	90				3900							
					2150		34	65.7			SANDY SILT (ML); to SILTY SAND (SM); fine sand, low plasticity, grey, moist to wet, (Sand/Silt Alluvium).	
-60		G	17						19			
	95				1000							
					3300						SILT (ML); low plasticity, grey, moist to wet, (Sand/Silt Alluvium).	
-65		G	18						20			
	100				2450							
					2600		40	69			SILT TO SANDY SILT (ML); fine sand, grey, wet, (Sand/Silt Alluvium).	
-70		G	19						21			
	105				1650						POORLY GRADED SAND (SP) to SILTY SAND (SM); fine sand, low plasticity, grey, wet, (Sand/Silt Alluvium).	
						LL=38 PL=33	43				INTERBEDDED LAYERS OF SILT TO SANDY SILT (ML); fine sand, low plasticity, grey, moist to wet, (Sand/Silt Alluvium).	
-75		G	20		3400				22			
	110				3400							
		G			1950		19	6.7				

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Foundation Engineering, Inc

PROJECT West Side CSO Project
CITY Portland, Oregon
PROJECT NO 2002013
DATE DRILLED 5/22/01 to 5/23/01

SHEET 4 OF 5
STATION NO. 244+41 28R
SURFACE ELEV. 32.68 ft
CORE BARREL SIZE 6 in.

INITIAL GWL@ 21 ft (5/22/01)
EQUIPMENT Boart Longyear Rotosonic Drill
DRILLING METHOD Rotosonic
LOGGED BY BF

SAMPLE TYPE G Grab Sample ◯ No Recovery

ELEVATION (ft)	DEPTH (ft)	SAMPLE TYPE	SAMPLE NO	PID (ppm)	METHANE (ppm)	LAB TESTS	MOISTURE CONT.	% FINES	BOX NUMBER	LITHOLOGY	SOIL DESCRIPTION	WELL
	115	G	21		5000		8	4.7	23		POORLY GRADED SAND WITH SILT (SP-SM); fine sand, few silt, low plasticity, grey, wet, (Sand/Silt Alluvium).	
-85	120	G	22		2400 7000			2.9	24		POORLY GRADED GRAVEL WITH SAND (GP); fine to coarse rounded gravel, fine to coarse sand, trace silt, dark grey, moist to wet, basaltic sand and gravel, (Gravel Alluvium).	
-90	125	G	23		6000 5000		5	3.5	25		POORLY GRADED GRAVEL WITH SAND (GP); fine to coarse, rounded to subrounded gravel, little to some fine to coarse sand, trace silt, grey to grey brown, wet, basaltic sand and gravel, (Gravel Alluvium).	
-95	130	G	24		7000 8500				26			
-100	135				5000 7000				27			
-105	140	G	25		0 0			0.0	28		Becomes WELL GRADED GRAVEL (GW); fine to coarse rounded to subrounded gravel, few coarse sand. Scattered quartzite gravel encountered below 138 feet.	
-110	145				0 0				29			
-115									30		Becomes POORLY GRADED GRAVEL WITH SAND (GP); subrounded to rounded, fine to coarse gravel, little fine to coarse sand, trace silt, low plasticity silt, grey, wet.	

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Foundation Engineering, Inc.

PROJECT West Side CSO Project
CITY Portland, Oregon
PROJECT NO. 2002013
DATE DRILLED 5/22/01 to 5/23/01

SHEET 5 OF 5
STATION NO. 244+41 28R
SURFACE ELEV. 32.68 ft
CORE BARREL SIZE 6 in.

INITIAL GWL@ 21 ft (5/22/01)
EQUIPMENT Boart Longyear Rotosonic Drill
DRILLING METHOD Rotosonic
LOGGED BY BF

SAMPLE TYPE G Grab Sample ◯ No Recovery

ELEVATION (ft)	DEPTH (ft)	SAMPLE TYPE	SAMPLE NO	PID (ppm)	METHANE (ppm)	LAB TESTS	MOISTURE CONT.	% FINES	BOX NUMBER	LITHOLOGY	SOIL DESCRIPTION	WELL
120	155	G	26		5000 19500		2	6.5	31		POORLY GRADED GRAVEL WITH SILT (GP-GM); subrounded to rounded, fine to coarse gravel, little fine to coarse sand, trace silt, low plasticity silt, grey, wet, (Gravel Alluvium).	
125					5000				32			
160					2500							
130							3	5.3				
		G	27		5000				33		Scattered cobbles encountered below 164 feet.	
	165				3400							
											Bottom of boring at 166 feet.	
135	170											
140												
	175											
145												
	180											
150												
	185											

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BORING LOG
PB-1005R

PACRIM GEOTECHNICAL INC.
GEOTECHNICAL ENGINEERING AND APPLIED EARTH SCIENCES

PROJECT: West Side CSO Project
CITY: Portland, Oregon
PROJECT NO.: 027-003
DATE DRILLED: 6/11/01 to 6/17/01

SHEET 1 OF 14
STATION NO.: 267+47 (3' L)
SURFACE ELEV.: 26.54 ft

INITIAL GWL@: 19.8 ft (6/13/01)
EQUIPMENT: Rotosonic Drill
DRILLING METHOD: Rotosonic - 8" OD Core Barrel
LOGGED BY: KJL

SAMPLE TYPE: G Grab Sample; ◯ No Recovery

ELEVATION (ft)	DEPTH (ft)	SAMPLE TYPE	SAMPLE NO	PID (ppm)	METHANE (ppm)	LAB TESTS	MOISTURE (%)	% FINES	BOX NUMBER	LITHOLOGY	SOIL DESCRIPTION
25				2000	0				1		**Artificial Fill (Qaf)** POORLY GRADED SAND (SP) with roots; 95-100% sand, fine to medium, brown, dry. No odors or staining.
											SILTY CLAY (CL) with organics and bits of wood, low to medium plasticity, no dilatancy, low toughness, mottled rusty brown to brown and gray.
	5	G	1	2000	0						POORLY GRADED SAND (SP) with roots; 95-100% sand, fine to medium, subangular to rounded, glass, basalt and lithics, black, moist, no odor or staining.
20				2000	0				2		
	10	G	2	2000	0						
15				1400	30%LEL				3		SILTY SAND / SANDY SILT (SM-ML); 45-55% sand, fine to medium; 45-55% silt; 5-10% wood pieces and bits to 0.5" diameter and to 3" length; dark gray, wet.
	15	G	3	2000	24%LEL	FC	60	76			FAT CLAY (CH), 2" thick layer (stiff), greenish gray, moist. ORGANIC SILT TO ELASTIC SILT (OH-MH) medium plasticity, slow dilatancy, low toughness, with wood pieces and bits of organics, dark gray, moist to wet, organic decay odor.
10				700	2300						POORLY GRADED SAND (SP) with bits and pieces of organics, fine roots; 98-100% sand, fine to medium, black, wet.
									4		ORGANIC SILT TO ELASTIC SILT (MH-OH); medium plasticity, none to slow dilatancy, low to medium toughness, bits and pieces of wood, dark gray, moist.
	20	G	4	2000							
5				700	2600						ORGANIC SILT TO ELASTIC SILT (MH-OH); with interbedded seams of Sand (SP), fine to medium; Silty Sand (SM); and Silt (ML).

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PACRIM GEOTECHNICAL INC.
GEOTECHNICAL ENGINEERING AND APPLIED EARTH SCIENCES

PROJECT West Side CSO Project
CITY Portland, Oregon
PROJECT NO. 027-003
DATE DRILLED 6/11/01 to 6/17/01

SHEET 2 OF 14
STATION NO. 267+47 (3' L)
SURFACE ELEV. 26.54 ft

INITIAL GWL@ 19.8 ft (6/13/01)
EQUIPMENT Rotosonic Drill
DRILLING METHOD Rotosonic - 8" OD Core Barrel
LOGGED BY KJL

SAMPLE TYPE G Grab Sample ▨ No Recovery

ELEVATION (ft)	DEPTH (ft)	SAMPLE TYPE	SAMPLE NO	PID (ppm)	METHANE (ppm)	LAB TESTS	MOISTURE (%)	% FINES	BOX NUMBER	LITHOLOGY	SOIL DESCRIPTION	WELL
									5		(Qaf Cont'd)	
	25	G	5	1300	950	AL	38				Lucky Lager Beer can at 24'.	
0				600	2800				6		ORGANIC SILT TO ELASTIC SILT (MH-OH), medium plasticity, no dilatancy, low to medium toughness, with organics and pieces of wood, with scattered glass, gravel, cobble and metal debris, dark gray, moist; interbedded with seams/layers of Silty Sand (SM), fine to medium, with wood, dark gray, moist to wet; Sand (SP), fine to medium , dark gray; and sandy silt (SM).	
		G	6			FC	41	49			SILTY GRAVEL (GM); 75-80% gravel, fine to coarse, rounded; 20-25% silt; dark gray, wet.	
	30			350	2200						SILTY GRAVEL (GM); 75-80% gravel, fine to coarse, rounded; 20-25% silt; dark gray, wet.	
-5											ORGANIC SILT TO ELASTIC SILT (MH-OH), medium plasticity, no dilatancy, low to medium toughness, with organics and pieces of wood, with scattered glass, gravel, cobbles, and metal debris, dark gray, moist; interbedded with seams/layers of Silty Sand (SM), fine to medium, with wood, dark gray, moist to wet; Sand (SP), fine to medium, dark gray; and Sandy Silt (SM).	
		G	7	700	500				7		POORLY GRADED SAND WITH WOOD (SP); 95-98% sand, fine to medium; 2-5% wood pieces, 1/4"-1/2" diameter to 6" width, dark gray, wet. No Recovery 34-36 feet. Metal debris lodged in bit of sampler and prevented material from entering.	
	35											
-10				2000	47%LEL						POORLY GRADED SAND (SP); 90-95% sand, fine to medium, subangular to rounded, glass, lithics; 5% gravel, fine, rounded, basalt, other; 0-2% wood, scattered metal/aluminium debris and beer can.	
									8			
		G	8			GSD	23	1				
	40										Grades: 95-98% sand, fine to medium.	
											Vibrating wire piezometer installed at 41 feet.	
-15												
		G	9	1200	4900	FC	23	1			Grades with pumice.	
									9		Note: No Recovery -- 43-56 feet. Driller error, washed out prior to retrieval of core barrel, when outer casing was being drilled down.	
											Material appears to be MH-OH based on soil adhering to outside of core barrel and non-collapsing hole after pulling casing.	

WSCSO PH-B, C & D WSCSO-C.GPJ WEST_CSO.GDT 9/4/01

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BORING LOG
PB-1005R

PACRIM GEOTECHNICAL INC.
GEOTECHNICAL ENGINEERING AND APPLIED EARTH SCIENCES

PROJECT West Side CSO Project
CITY Portland, Oregon
PROJECT NO. 027-003
DATE DRILLED 6/11/01 to 6/17/01

SHEET 3 OF 14
STATION NO. 267+47 (3' L)
SURFACE ELEV. 26.54 ft

INITIAL GWL@ 19.8 ft (6/13/01)
EQUIPMENT Rotosonic Drill
DRILLING METHOD Rotosonic - 8" OD Core Barrel
LOGGED BY KJL

SAMPLE TYPE G Grab Sample ◯ No Recovery

ELEVATION (ft)	DEPTH (ft)	SAMPLE TYPE	SAMPLE NO	PID (ppm)	METHANE (ppm)	LAB TESTS	MOISTURE (%)	% FINES	BOX NUMBER	LITHOLOGY	SOIL DESCRIPTION	WELL
-20									10		Note: No Recovery -- 43-56 feet. Driller error, washed out prior to retrieval of core barrel, when outer casing was being drilled down. (Qaf Cont'd) Material appears to be MH-OH based on soil adhering to outside of core barrel and non-collapsing hole after pulling casing.	
	50	G	10									
-25									11			
	55	G	11									
-30					10%LEL						POORLY GRADED GRAVEL WITH SAND (GP); 55-60% gravel, fine to coarse, rounded, basalt; 40-45% sand, fine to medium, with wood, dark gray, wet, organic odor.	
											SILTY SAND (SM); 70-80% sand, fine; 20-25% silt; 5% wood; dark gray, wet.	
									12		SANDY SILT WITH WOOD AND ORGANICS (ML); non-plastic, rapid dilatancy, dark gray, wet, organic odor. Increasing silt to 40-50%.	
	60	G	12		25%LEL	FC	43	45			ORGANIC SILT TO ELASTIC SILT (MH-OH) with wood and organics, medium plasticity, no dilatancy, medium toughness, high dry strength, with bits and pieces of wood, interbedded with seams and layers of silt (ML), non plastic, rapid dilatancy with pieces of wood.	
-35					27%LEL							
									13			
	65	G	13		17%LEL							
-40					12%LEL							

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GEOTECHNICAL ENGINEERING AND APPLIED EARTH SCIENCES

PROJECT West Side CSO Project
CITY Portland, Oregon
PROJECT NO. 027-003
DATE DRILLED 6/11/01 to 6/17/01

SHEET 4 OF 14
STATION NO. 267+47 (3' L)
SURFACE ELEV. 26.54 ft

INITIAL GWL@ 19.8 ft (6/13/01)
EQUIPMENT Rotosonic Drill
DRILLING METHOD Rotosonic - 8" OD Core Barrel
LOGGED BY KJL

SAMPLE TYPE G Grab Sample ◯ No Recovery

ELEVATION (ft)	DEPTH (ft)	SAMPLE TYPE	SAMPLE NO	PID (ppm)	METHANE (ppm)	LAB TESTS	MOISTURE (%)	% FINES	BOX NUMBER	LITHOLOGY	SOIL DESCRIPTION	WELL
											(Qaf Cont'd)	
									14		ORGANIC SILT TO ELASTIC SILT (MH-OH) with wood and organics, medium plasticity, no dilatancy, medium toughness, high dry strength, with bits and pieces of wood, interbedded with seams and layers of silt (ML), non plastic, rapid dilatancy with pieces of wood.	
		G	14			GSD	22	13			**Sand/Silt Alluvium (Qal/Qff)**	
	70				43%LEL						POORLY GRADED SAND WITH WOOD CHIPS AND GRAVEL (SP); 80-85% sand, fine to medium, basalt, lithics, glass; 5-10% gravel, fine, rounded, basalt; 5-10% wood chips; with occasional layers of organic silt / elastic silt (MH-OH); dark gray, moist. Redrilled from 71 to 76 ft to recover sample.	
-45					43%LEL							
									15		POORLY GRADED SAND (SP); 100% sand, fine to medium, subangular to rounded, glass, basalt and other lithics, with scattered seams to layers of sandy silt (ML), with bits of wood, dark gray, wet.	
	75	G	15		600						Wood pushed ahead of bit preventing recovery.	
-50											Note: No Recovery -- first attempt from 76 to 81 ft. Resample and recovered from 79 to 81 ft in 2nd attempt.	
									16			
		G	16			GSD	35	27				
	80											
-55					22%LEL							
									17		SANDY SILT (ML) with occasional seam of fine sand with ash, non plastic, rapid dilatancy, dark gray, wet.	
		G	17					68			Ash and pumice layer from 84.5 to 84.8 ft.	
	85				3350						POORLY GRADED SAND WITH ASH AND PUMICE (SP); 85-90% sand, fine to medium, subangular to rounded, glass, basalt, pumice and ash; 10-15% gravel, fine, rounded, pumice.	
-60					4350							
									18		POORLY GRADED SAND (SP), 100% sand, fine to medium, trace coarse, subangular to rounded, glass, basalt, pumice and other lithics, with occasional scattered rip-up clast of silty clay, 1/4" thick by 1" long, dark gray to black, wet.	
		G	18									

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GEOTECHNICAL ENGINEERING AND APPLIED EARTH SCIENCES

PROJECT West Side CSO Project
CITY Portland, Oregon
PROJECT NO. 027-003
DATE DRILLED 6/11/01 to 6/17/01

SHEET 5 OF 14
STATION NO. 267+47 (3' L)
SURFACE ELEV. 26.54 ft

INITIAL GWL@ 19.8 ft (6/13/01)
EQUIPMENT Rotosonic Drill
DRILLING METHOD Rotosonic - 8" OD Core Barrel
LOGGED BY KJL

SAMPLE TYPE G Grab Sample ○ No Recovery

ELEVATION (ft)	DEPTH (ft)	SAMPLE TYPE	SAMPLE NO	PID (ppm)	METHANE (ppm)	LAB TESTS	MOISTURE (%)	% FINES	BOX NUMBER	LITHOLOGY	SOIL DESCRIPTION	WELL
-65					12%LEL						(Qal/Qff Cont'd)	
											POORLY GRADED SAND (SP), 100% sand, fine to medium, trace coarse, subangular to rounded, glass, basalt, pumice and other lithics, with occasional scattered rip-up clast of silty clay, 1/4" thick by 1" long, dark gray to black, wet.	
					18%LEL				19			
	95	G	19									
					17%LEL							
-70												
					3300							
									20			
		G	20								POORLY GRADED SAND (SP); 100% sand, fine to medium, subangular to rounded, glass, basalt and other lithics, with occasional pieces of wood.	
	100				10%LEL						POORLY GRADED SAND (SP); 100% sand, fine to medium, subangular to rounded, glass, basalt and other lithics, with occasional pieces of wood.	
-75											Vibrating wire piezometer installed at 101 feet.	
					10%LEL							
									21			
		G	21									
	105				10%LEL							
-80											11' of heave overnight, 6/12/01 - 6/13/01.	
					650						Note: 6' of heave after extracting core barrel with sample from 106 to 121 ft with other casing at 106 ft.	
									22			
		G	22									
	110				2200						POORLY GRADED SAND (SP); 98-100% sand, fine to medium, subangular to rounded, glass, basalt and other lithics, with bits of organics; 0-2% gravel, fine, rounded, basalt, with scattered seams of Silty Sand (SM) and Silt (ML), and layers of fine Sand (SP); dark gray, wet.	
-85					10%LEL							

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GEOTECHNICAL ENGINEERING AND APPLIED EARTH SCIENCES

PROJECT West Side CSO Project
CITY Portland, Oregon
PROJECT NO. 027-003
DATE DRILLED 6/11/01 to 6/17/01

SHEET 6 OF 14
STATION NO. 267+47 (3' L)
SURFACE ELEV. 26.54 ft

INITIAL GWL@ 19.8 ft (6/13/01)
EQUIPMENT Rotosonic Drill
DRILLING METHOD Rotosonic - 8" OD Core Barrel
LOGGED BY KJL

SAMPLE TYPE G Grab Sample ◯ No Recovery

ELEVATION (ft)	DEPTH (ft)	SAMPLE TYPE	SAMPLE NO	PID (ppm)	METHANE (ppm)	LAB TESTS	MOISTURE (%)	% FINES	BOX NUMBER	LITHOLOGY	SOIL DESCRIPTION	WELL
											(Qal/Qff Cont'd)	
									23		POORLY GRADED SAND (SP); 98-100% sand, fine to medium, subangular to rounded, glass, basalt and other lithics, with bits of organics; 0-2% gravel, fine, rounded, basalt, with scattered seams of Silty Sand (SM) and Silt (ML), and layers of fine Sand (SP); dark gray, wet.	
			TUNNEL CROWN									
-90	115	G	23		2300							
					1550				24		Grades to fine sand.	
	120	G	24		81%LEL	GSD	31	10				
-95					900						POORLY GRADED SAND (SP); 98-100% sand, fine to medium, subangular to rounded, glass, basalt and other lithics, with layers of fine Sand (SP), and seams of Silty fine Sand (SM) and Silt (ML), non plastic, rapid dilatancy, with bits of wood, and organics, black, wet.	
									25			
	125	G	25		40%LEL							
-100					1200							
									26		SILTY SAND (SM); 80-85% fine sand; 15-20% silt.	
		G	TUNNEL INVERT					60				
	130				1150						POORLY GRADED SAND (SP); 98-100% sand, fine to medium, subangular to rounded, glass, quartz, basalt and other lithics; with occasional seams to layers of Silty Sand (SM); and Silt (ML), non plastic, rapid dilatancy, with bits of wood and organics; black, wet.	
-105					3900							
									27			
		G	27		1100						Note: No Recovery -- 134.5 to 136 ft sample fell out of core barrel during retrieval.	

Note: No Recovery -- 134.5 to 136 ft sample fell out of core barrel during retrieval.

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GEOTECHNICAL ENGINEERING AND APPLIED EARTH SCIENCES

PROJECT: West Side CSO Project
CITY: Portland, Oregon
PROJECT NO.: 027-003
DATE DRILLED: 6/11/01 to 6/17/01

SHEET 7 OF 14
STATION NO.: 267+47 (3' L)
SURFACE ELEV.: 26.54 ft

INITIAL GWL@: 19.8 ft (6/13/01)
EQUIPMENT: Rotosonic Drill
DRILLING METHOD: Rotosonic - 8" OD Core Barrel
LOGGED BY: KJL

SAMPLE TYPE: G Grab Sample; ◯ No Recovery

ELEVATION (ft)	DEPTH (ft)	SAMPLE TYPE	SAMPLE NO	PID (ppm)	METHANE (ppm)	LAB TESTS	MOISTURE (%)	% FINES	BOX NUMBER	LITHOLOGY	SOIL DESCRIPTION
											Note: 29 ft of heave after pulling sample from 136 to 151 ft. (Qal/Qff Cont'd)
-110					0						POORLY GRADED SAND (SP); 95-100% sand, fine to medium, subangular to rounded, glass, quartz, basalt, and other lithics; 0-2% gravel, fine, rounded, basalt; black, wet.
									28		Note: 29 ft of heave after pulling sample from 136 to 151 ft.
	140	G	28		350						
-115					0						
									29		
		G	29			GSD	29	8			Note: No Recovery from 144 to 151 ft.
	145				450						
-120											
									30		
		G	30								
	150										
-125					2200						
									31		
		G	31								Increasing gravel.
	155				2500						
											Gravel Alluvium (Qfc)
-130					3250						POORLY GRADED GRAVEL WITH SAND (GP); 75-80% gravel, fine to coarse, subrounded to rounded, basalt; 20-25% sand, fine to medium, glass, quartz, basalt and others; black, wet.

WSCSO PH-B_C & D_WSCSO-C.GPJ WEST_CSO.GDT 9/4/01

PARSONS BRINCKERHOFF

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PB-1005R

PACRIM GEOTECHNICAL INC.
GEOTECHNICAL ENGINEERING AND APPLIED EARTH SCIENCES

PROJECT West Side CSO Project
CITY Portland, Oregon
PROJECT NO. 027-003
DATE DRILLED 6/11/01 to 6/17/01

SHEET 8 OF 14
STATION NO. 267+47 (3' L).
SURFACE ELEV. 26.54 ft

INITIAL GWL@ 19.8 ft (6/13/01)
EQUIPMENT Rotosonic Drill
DRILLING METHOD Rotosonic - 8" OD Core Barrel
LOGGED BY KJL

SAMPLE TYPE G Grab Sample ▢ No Recovery

ELEVATION (ft)	DEPTH (ft)	SAMPLE TYPE	SAMPLE NO	PID (ppm)	METHANE (ppm)	LAB TESTS	MOISTURE (%)	% FINES	BOX NUMBER	LITHOLOGY	SOIL DESCRIPTION	WELL
											(Qfc Cont'd)	
		G	32						32		POORLY GRADED GRAVEL WITH SAND (GP); 75-80% gravel, fine to coarse, subrounded to rounded, basalt; 20-25% sand, fine to medium, glass, quartz, basalt and others; black, wet. Decreasing sand.	
	160				2150						POORLY GRADED GRAVEL (GP), 100% gravel, fine to coarse, subrounded to rounded, basalt and others, no sand or fines, some cobbles to 4" in length.	
135					0						Vibrating wire piezometer installed at 161 feet.	
		G	33						33			
	165										Note -- No Recovery from 164 to 166 ft.	
140					44%LEL						WELL GRADED GRAVEL (GW) with cobbles and sand; 85-90% gravel, fine to coarse, cobbles > 6" in diameter, subrounded to rounded, predominantly basalt, some quartzite and andesite; 10-15% sand, fine to coarse, subangular to rounded, glass, quartz, basalt and others.	
		G	34			GSD	6	6	34		Abundant cobbles from 169 to 171 ft with very little matrix. 90-95% gravel, 5-10% sand.	
	170				41%CH4							
145					1100						Troutdale (Tt)	
		G	35						35		POORLY GRADED GRAVEL WITH COBBLES AND SAND (GP); 70-75% gravel, fine to coarse, subrounded to rounded, predominantly basalt, some quartzite and others, some gravel has unoxidized pyrite on surface; 25-30% sand, fine to medium, subangular to rounded, glass, quartz, basalt, mica and others; dark gray, wet.	
	175				850							
150					2450							
		G	36						36			

WSCSO PH-B C & D WSCSO-C.GPJ WEST_CSO.GDT 9/4/01

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PACRIM GEOTECHNICAL INC.
GEOTECHNICAL ENGINEERING AND APPLIED EARTH SCIENCES

PROJECT West Side CSO Project
CITY Portland, Oregon
PROJECT NO. 027-003
DATE DRILLED 6/11/01 to 6/17/01

SHEET 9 OF 14
STATION NO. 267+47 (3' L)
SURFACE ELEV. 26.54 ft

INITIAL GWL@ 19.8 ft (6/13/01)
EQUIPMENT Rotosonic Drill
DRILLING METHOD Rotosonic - 8" OD Core Barrel
LOGGED BY KJL

SAMPLE TYPE G Grab Sample ◯ No Recovery

ELEVATION (ft)	DEPTH (ft)	SAMPLE TYPE	SAMPLE NO	PID (ppm)	METHANE (ppm)	LAB TESTS	MOISTURE (%)	% FINES	BOX NUMBER	LITHOLOGY	SOIL DESCRIPTION	WELL
-155					4300						(Tt Cont'd)	
					3150						POORLY GRADED GRAVEL WITH COBBLES AND SAND (GP); 70-75% gravel, fine to coarse, cobbles to 5". subrounded to rounded, basalt, quartzite and others, 25-30% sand, subangular to rounded, glass, quartz, mica, basalt and other lithics; dark gray, wet.	
									37			
		G	37									
	185				24%LEL						100% gravel and cobbles to 5" in diameter.	
-160					350						POORLY GRADED GRAVEL WITH COBBLES AND SAND (GP); 70-75% gravel, fine to coarse, cobbles to 5", subrounded to rounded, basalt, quartzite and others; 25-30% sand, fine to medium, subangular to rounded, glass, quartz, mica, basalt and others; dark gray, wet.	
											Vibrating wire piezometer installed at 186 feet.	
									38			
		G	38			GSD	5	3				
	190				350						Some gravel clasts have a spotty coating of fine to medium sand cemented to surface.	
-165					400							
									39			
		G	39									
	195				350						Note: 196 to 199 ft Disturbed washed sample.	
-170					500							
									40			
		G	40									
	200				250						Grades: 75-80% gravel, 20-25% sand.	
-175					250							

WSCSO PH-B C & D WSCSO-C.GPJ WEST_CSO.GDT 9/4/01

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PACRIM GEOTECHNICAL INC.
GEOTECHNICAL ENGINEERING AND APPLIED EARTH SCIENCES

PROJECT West Side CSO Project
CITY Portland, Oregon
PROJECT NO. 027-003
DATE DRILLED 6/11/01 to 6/17/01

SHEET 10 OF 14
STATION NO. 267+47 (3' L)
SURFACE ELEV. 26.54 ft

INITIAL GWL@ 19.8 ft (6/13/01)
EQUIPMENT Rotosonic Drill
DRILLING METHOD Rotosonic - 8" OD Core Barrel
LOGGED BY KJL

SAMPLE TYPE G Grab Sample ◯ No Recovery

ELEVATION (ft)	DEPTH (ft)	SAMPLE TYPE	SAMPLE NO	PID (ppm)	METHANE (ppm)	LAB TESTS	MOISTURE (%)	% FINES	BOX NUMBER	LITHOLOGY	SOIL DESCRIPTION	WELL
											(Tt Cont'd)	
		G	41		350				41		POORLY GRADED GRAVEL WITH COBBLES AND SAND (GP); 75-80% gravel, fine to coarse, cobbles to 6", subrounded to rounded, basalt, quartzite and others; 20-25% sand, fine to medium, subangular to rounded, glass, quartz, mica, basalt and others; gray, wet.	
205												
		G	42A		2750	GSD	5	4				
180									42		POORLY GRADED GRAVEL WITH COBBLES AND SAND (GP); 70-75% gravel, fine to coarse, cobbles > 6", subrounded to rounded, predominantly basalt, some quartzite and others; gray, wet.	
		G	42		2500							
210												
185					12%LEL				43			
		G	43		4150							
215											Note: 10 ft of heave after pulling core barrel with outer casing at 216 ft.	
190					3250				44			
		G	44		950							
220											POORLY GRADED GRAVEL WITH COBBLES AND SAND (GP); 75-80% gravel, fine to coarse, cobbles to 5" in diameter, subrounded to rounded, predominantly basalt, quartzite and others; 20-25% sand, fine to medium, subangular to rounded, glass, quartz, mica, basalt and others; gray, wet,	
195					1000				45			
		G	45									

WSCSO PH-B C & D WSCSO-C.GPJ WEST_CSO.GDT 9/4/01

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PACRIM GEOTECHNICAL INC.
GEOTECHNICAL ENGINEERING AND APPLIED EARTH SCIENCES

PROJECT West Side CSO Project
CITY Portland, Oregon
PROJECT NO. 027-003
DATE DRILLED 6/11/01 to 6/17/01

SHEET 11 OF 14
STATION NO. 267+47 (3' L)
SURFACE ELEV. 26.54 ft

INITIAL GWL@ 19.8 ft (6/13/01)
EQUIPMENT Rotosonic Drill
DRILLING METHOD Rotosonic - 8" OD Core Barrel
LOGGED BY KJL

SAMPLE TYPE G Grab Sample ◯ No Recovery

ELEVATION (ft)	DEPTH (ft)	SAMPLE TYPE	SAMPLE NO	PID (ppm)	METHANE (ppm)	LAB TESTS	MOISTURE (%)	% FINES	BOX NUMBER	LITHOLOGY	SOIL DESCRIPTION
					700						(Tt Cont'd)
-200					1100				46		POORLY GRADED GRAVEL WITH COBBLES AND SAND (GP); 75-80% gravel, fine to coarse, cobbles to 5" in diameter, subrounded to rounded, predominantly basalt, quartzite and others; 20-25% sand, fine to medium, subangular to rounded, glass, quartz, mica, basalt and others; gray, wet,
	230	G	46		900	GSD	5	4			
-205					450				47		Vibrating wire piezometer installed at 231 feet.
	235	G	47		750						Occasional cobble greater than 6" in diameter.
-210					4150				48		POORLY GRADED SAND WITH GRAVEL (SP); 70-75% sand, fine to medium, subangular to rounded, glass, quartz, mica, basalt and others; 25-30% gravel, fine to coarse, subrounded to rounded, basalt, quartzite and others; gray, wet.
	240	G	48		22%LEL						
-215					15%LEL						Decreasing gravel content, 85-90% sand, 10-15% sand.
									49		Decreasing gravel content, 85-90% sand, 10-15% sand.
	245	G	49		3000						Grades: 85-90% sand, 10-15% gravel.
-220					2600						

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GEOTECHNICAL ENGINEERING AND APPLIED EARTH SCIENCES

PROJECT West Side CSO Project
CITY Portland, Oregon
PROJECT NO. 027-003
DATE DRILLED 6/11/01 to 6/17/01

SHEET 12 OF 14
STATION NO. 267+47 (3' L)
SURFACE ELEV. 26.54 ft

INITIAL GWL@ 19.8 ft (6/13/01)
EQUIPMENT Rotosonic Drill
DRILLING METHOD Rotosonic - 8" OD Core Barrel
LOGGED BY KJL

SAMPLE TYPE G Grab Sample ▢ No Recovery

ELEVATION (ft)	DEPTH (ft)	SAMPLE TYPE	SAMPLE NO	PID (ppm)	METHANE (ppm)	LAB TESTS	MOISTURE (%)	% FINES	BOX NUMBER	LITHOLOGY	SOIL DESCRIPTION	WELL
											(Tt Cont'd)	
									50		POORLY GRADED GRAVEL WITH SAND AND COBBLES (GP); 55-60% gravel, fine to coarse, subrounded to rounded, basalt, quartzite and others, gray, wet; 40-45% sand, fine to medium, subangular to rounded, glass, quartz, mica, basalt and others, gray, wet.	
		G	50									
	250				34%LEL						POORLY GRADED SAND (SP); 95-100% sand, fine to medium, subangular to rounded, glass, quartz, mica, basalt; 0-5% gravel, fine to coarse, subrounded to rounded, predominantly basalt.	
-225					12%LEL							
		G	51			GSD	20	6	51		Note: No recovery from 254 to 256 ft. Sample fell out during retrieval of core barrel.	
	255											
-230					2450						Note: Switched to 3.5 inch I.D. core barrel. Note: 15 ft of heave after pulling sample from 256 to 266 ft with outer casing at 256 ft.	
									52			
		G	52									
	260				3200							
-235					2150						Gravel layer from 262 to 263 ft.	
									53			
		G	53									
	265				1450						POORLY GRADED GRAVEL WITH SAND (GP); 65-70% gravel, fine to coarse, subrounded to rounded, basalt, quartzite and others; 30-35% sand, fine to medium, subangular to rounded, glass, quartz, mica, basalt and others, gray, wet.	
-240					0							
									54		Increasing silt content.	
		G	54									
											POORLY GRADED GRAVEL WITH SAND, COBBLES AND SILT (GP-GM); 65-70%	

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GEOTECHNICAL ENGINEERING AND APPLIED EARTH SCIENCES

PROJECT West Side CSO Project
CITY Portland, Oregon
PROJECT NO. 027-003
DATE DRILLED 6/11/01 to 6/17/01

SHEET 13 OF 14
STATION NO. 267+47 (3' L)
SURFACE ELEV. 26.54 ft

INITIAL GWL@ 19.8 ft (6/13/01)
EQUIPMENT Rotosonic Drill
DRILLING METHOD Rotosonic - 8" OD Core Barrel
LOGGED BY KJL

SAMPLE TYPE G Grab Sample ◯ No Recovery

ELEVATION (ft)	DEPTH (ft)	SAMPLE TYPE	SAMPLE NO	PID (ppm)	METHANE (ppm)	LAB TESTS	MOISTURE (%)	% FINES	BOX NUMBER	LITHOLOGY	SOIL DESCRIPTION
					0						gravel, fine to coarse, subrounded to rounded, basalt and others; 25-30% sand, fine to medium, subangular to rounded, glass, mica, quartz, basalt; 5-10% silt; gray, wet. (Tt Cont'd)
-245					0						POORLY GRADED GRAVEL WITH COBBLES AND SAND (GP); 70-75% gravel, fine to coarse, subrounded to rounded, basalt, quartzite and others; 25-30% sand, fine to medium, glass, quartz, mica, basalt and others; 0-5% silt; gray, wet.
									55		
		G	55			GSD	7	10			
	275				250						Increasing silt at 275 ft. Cobbles > 4" in diameter.
-250					0						POORLY GRADED GRAVEL WITH COBBLES, SAND AND SILT (GP-GM); 65-70% gravel, fine to coarse, subrounded to rounded, basalt and others; 25-30% sand, fine to coarse, subangular to rounded, glass, quartz, mica, basalt and others; 5-10% silt; dark gray, wet.
									56		
		G	56								
	280				400						POORLY GRADED GRAVEL WITH COBBLES AND SAND (GP); 70-75% gravel, fine to coarse, cobbles >4" in diameter, subrounded to rounded, basalt and others; 25-30% sand, fine to medium, subangular to rounded, glass, trace mica, basalt and others; <5% silt; dark gray, wet.
-255					0						**Sandy River Mudstone (Tsr)**
									57		SILTY CLAY (CL), medium plasticity, no dilatancy, when wetted, medium toughness, high to very high dry strength, greenish gray to grayish green, very hard, moist, with occasional mottled zones of light brown to brown silty clay, with bits of organics and distorted laminations/varves of light gray silty clay and grayish green fat clay.
		G	57								
	285				250						FAT CLAY (CH); high plasticity, no dilatancy, very high dry strength when wetted, medium to high toughness, greenish gray, very hard, moist, with distorted laminations/varves of light gray silty clay and grayish green fat clay.
-260					200						
									58		
		G	58								
	290				0						
-265					1450						

WSCSO PH-B C & D WSCSO-C.GPJ WEST_CSO.GDT 9/4/01

PARSONS BRINCKERHOFF

BORING LOG
PB-1005R

PACRIM GEOTECHNICAL INC.
GEOTECHNICAL ENGINEERING AND APPLIED EARTH SCIENCES

PROJECT West Side CSO Project
CITY Portland, Oregon
PROJECT NO. 027-003
DATE DRILLED 6/11/01 to 6/17/01

SHEET 14 OF 14
STATION NO. 267+47 (3' L)
SURFACE ELEV. 26.54 ft

INITIAL GWL@ 19.8 ft (6/13/01)
EQUIPMENT Rotosonic Drill
DRILLING METHOD Rotosonic - 8" OD Core Barrel
LOGGED BY KJL

SAMPLE TYPE G Grab Sample ◯ No Recovery

ELEVATION (ft)	DEPTH (ft)	SAMPLE TYPE	SAMPLE NO	PID (ppm)	METHANE (ppm)	LAB TESTS	MOISTURE (%)	% FINES	BOX NUMBER	LITHOLOGY	SOIL DESCRIPTION	WELL
											(Tsr Cont'd)	
									59		FAT CLAY (CH); high plasticity, no dilatancy, very high dry strength when wetted, medium to high toughness, greenish gray, very hard, moist, with distorted laminations/varves of light gray silty clay and grayish green fat clay.	
		G	59									
	295				1450							
-270												
											SILTY CLAY WITH SEAMS OF SILTSTONE (CL); medium plasticity, slow to rapid dilatancy when wetted and remolded, low to medium toughness, dark green; Siltstone, weakly cemented, poorly indurated; with occasional seam of silt, non plastic, rapid dilatancy when remolded and wetted; dark green, very hard.	
					800				60			
		G	60									
	300											
											FAT CLAY (CH); high plasticity, no dilatancy, when wetted very high dry strength, medium to high toughness, greenish gray, very hard, moist, with distorted laminations/varves of light gray silty clay and grayish green fat clay.	
-275									61			
					350							
											Five vibrating wire piezometers installed as shown. Boring completed to a depth of 303 on 06/17/01.	
	305											
-280												
	310											
-285												

W:\SCSO PH-B C & D W\SCSO-C.GPJ WEST_CSO.GDT 9/4/01